8.1 PURITY, FORMULATIONS AND CHROMATOGRAPHY

Pure substances

- Chemistry definition: A substance that contains only one compound or element
- Everyday definition: A substance with nothing added to it.
- E.g. pure milk
- A pure substance will melt/boil at a specific temperature
- The melting or boiling point of a sample can be compared with the actual value in a data book
- The closer the recorded value to the exact value, the purer the substance
- Boiling or melting point used to determine purity
- Impurities in the sample will increase the melting point and cause the sample to melt over a wider range of temperatures
- Impurities in the sample will decrease the boiling point and cause the sample to boil over a wider

Formulations

- Mixtures designed for a particular use
- Made by mixing the components in precise quantities
- Ensures the formulation has the correct properties
- Formulations are found in paints, fuels, cleaning products, cosmetic, fertilisers and foods

Chromatography

- Separates substances in a mixture
- Separation depends on the distribution of the substances between the two phases
- E.g. paper in paper chromatography
- Stationary phase - where the molecules can't move
- Mobile phase - where the molecules can move
- A solvent, e.g. water or ethanol
- Chromatogram
- Rf values
- Rf = distance moved by substance/ distance moved by solvent
- Different compounds have different Rf values in different solvents
- Allows the constituent substances of the mixture to be identified
- Paper chromatography
- The solvent moves up the paper, carrying the substances in the mixture
- The more soluble a chemical, the more time is spends in the solvent, meaning it will move further up the paper
- The compounds in a mixture should separate into different spots (depends on solvent)
- Pure compounds will produce a single spot in all solvents